Resource Guide for Chemistry Road Show of TAMU

Genie in a Bottle
(MnO$_2$/H$_2$O$_2$) Exothermic decomposition of hydrogen peroxide to give oxygen and water at high temperature (steam!!)

Burning Book
(Magic vs. Science)

CO$_2$ Bubbler

Disappearing/Reappearing Beaker
Refractive Index of Glass

Elephant Toothpaste
Decomposition of hydrogen peroxide (again) but with some creative flare.

Calcium Carbide Cannon & Self-Carving Pumpkin
Components of combustion: Heat, Fuel, Oxygen,

\[
\text{Ca}^2+ \left( + \text{H}_2\text{O} \right) \rightarrow \text{Ca}({\text{OH}})_2 + \text{C} + \text{H}
\]

Silver Mirror
Tollen's Test (similar to chemistry used in some diabetes tests available commercially). Oxidation/Reduction: Silver diamine oxidation of glucose. Silver cation reduced to silver metal in zero valent state.

\[
\text{R}^+ \cdot \text{C} \cdot \text{H} + 2 \text{Ag(NH}_3)_2^+ + 3 \text{OH}^- \rightarrow \text{R}^+ \cdot \text{C} \cdot \text{H} + 2 \text{Ag} + 2 \text{H}_2\text{O} + 4 \text{NH}_3
\]

Everlasting Ice Cream
Polymer used for insulation, car seats, arm rests, etc.

Oscillating Reaction
This is an example of an oscillating reaction. It is a very complex series of reduction/oxidation reactions. It can help students visualize cyclic biological reactions.

Dry Ice Colorful Cylinder
Dry Ice in Water with Universal Indicator (Sublimation; Acid/Base Chemistry; Reaction of CO$_2$ with water to make carbonic acid which is found in soft drinks and is responsible for some of rainfalls acidity)

Collapsing Bottle
CO$_2$ in 2 L bottle reacts with 35 mL of 6 M NaOH, the carbonic acid from the reaction of CO$_2$ with water is neutralized by the base. CO$_2$ is drawn out of the atmosphere in the bottle, which creates a vacuum, and the bottle is crushed by atmospheric pressure.
Rainbow Magic
Acid/Base Indicators

Liquid Nitrogen Dragon, Flowers, Shrinking Balloons, Hand
The Temperature of liquid nitrogen is -196°C or -321°F. Looking at the effects of extreme low temperatures.

Luminol Skull
Chemiluminescence, creating light as a product of a chemical reaction.

Elemental Colors
Flame Test: Emission spectra of various metals

Fire Tornado
Motion of gasses, Chimney effect, hot air rises and draws in more air to feed the flame

Food Coloring, Violet

Due to time limitations, several experiment may not be done.